Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A spectrometer suitable for analyzing ~~the~~a spectra composition of an optical beam, the spectrometer enabling ~~the~~a detection of light of a particular wavelength, the spectrometer comprising:

a. an entrance slit for allowing ~~the~~an entry of the optical beam into the spectrometer, ~~the~~a location of the entrance slit being adjustable for controlling ~~the~~a performance of the spectrometer;

b. a detector for detecting the optical beam, a~~the~~ location of the detector being adjustable for controlling a~~the~~ performance of the spectrometer; and

c. a curved grating for analyzing the spectra composition of the optical beam, the curved grating comprising a plurality of grooves, a~~the~~ distance between the grooves being dependent on the location of the entrance slit and the detector, a~~the~~ center of operation wavelength, the diffraction order, a~~the~~ refractive index of the medium and ~~optionally~~ on the location of the adjacent grooves, such that a path difference between two adjacent grooves is an integral of the center of operation wavelength,

wherein an arc length of each of the grooves is the same.

~~[This claim protects the general spectrometer embodiment of the invention: entrance slit, detectors can be located anywhere]~~

2. (Currently Amended) The spectrometer as recited in claim 1, wherein the entrance slit and the detector are located on a~~the~~ tangent circle.

~~[This covers constant arc length and detector and tangent circle embodiment]~~

3. (Currently Amended) The spectrometer as recited in claim 1, wherein the curved grating has one of a~~the~~ straight, sinusoidal and elliptical shapes.

4. (Currently Amended) The spectrometer as recited in claim 1, wherein the spectrometer is in accordance with athe Littrow configuration.

5. (Currently Amended) The spectrometer as recited in claim 1, wherein the spectrometer is used as a wavelength dispersion element in a photonic integrated circuit.

6. (Currently Amended) The spectrometer as recited in claim 1, wherein the spectrometer is ~~used as~~ an isolated optical spectrometer using discrete components, the discrete components including slits, gratings, spectrometer casing detector, detector array and motor drive.
~~[This claim protects the embodiment in which spectrometer is used as isolated optical spectrometer]~~

7. (Currently Amended) A compact curved grating suitable for analyzing the spectra composition of an optical beam, the optical beam being incident on the compact curved grating via an entrance slit, the analyzed optical beam from the compact curved grating being incident on a detector, the compact curved grating comprising a plurality of grooves, the distance between the grooves being dependent on the location of the entrance slit and the detector, the center operation wavelength, a diffraction order, the refractive index of the medium and ~~optionally~~ on the location of the adjacent grooves, such that a path difference between two adjacent grooves is an integral of the center of operation wavelength,

wherein an arc length of each of the grooves is the same.

8. (Currently Amended) A method for analyzing athe spectra composition of an optical beam, the method comprising:

_____a._adjusting a location of an entrance slit in order to have best performance at a particular design goal, the optical beam entering the spectrometer through the entrance slit;

_____b. adjusting a location of a detector in order to have best performance at a particular design goal, the spectra composition of the optical beam being detected by the detector; and

c. using a compact curve grating in order to analyze the spectra composition of the optical beam, the compact curved grating comprising a plurality of grooves, the step of using the compact curved grating further comprising the step of:

i. calculating initial groove spacing using the information relating to location of the entrance slit and the detector, center of the operation wavelength, refractive index of the medium and the diffraction order; and

ii. determining the positions of other grooves, the position being determined by ensuring that path difference between adjacent grooves is an integral multiple of the wavelength in the medium, according to the following mathematical expression:

$$[d_1(\Theta_1,S_1,X_i)+d_2(\Theta_2,S_2,X_i)] - [d_1(\Theta_1,S_1,X_{i-1})+d_2(\Theta_2,S_2,X_{i-1})]=m\lambda/n$$

_____wherein $d_1(\Theta_1,S_1,X_i)$ is a distance from one of the plurality of grooves located at X_i from the entrance slit, $d_2(\Theta_2,S_2,X_i)$ is a distance from one of the plurality of grooves form the detector, m is a diffraction order and n is a refractive index of the medium, and further wherein an arc length of each of the grooves is the same.

~~[This claim protects the disclosed method of analyzing spectra composition of an optical beam]~~